

REMARKS

Claims 1, 4-9 and 12-24 are pending in this application. Claims 15-20 are withdrawn from consideration. By this Amendment, claims 1, 4-6, 9, 12, 15-19 and 21-24 are amended. No new matter is added. Reconsideration of the application is respectfully requested.

The Examiner is reminded that claims 15-20 are currently withdrawn from further consideration; however, rejoinder and allowance of these claims are requested upon allowance of elected claim 21. Claims 15-20 are amended to improve their form.

The Office Action rejects claim 6 under 35 U.S.C. §112, second paragraph. Applicants respectfully request withdrawal of this rejection for the following reasons.

Claim 6 recites that the polarization state of the recording beam which is used for recording the second hologram is changed from that of the first hologram, in order to cause the reconstructed beam diffracted from the second hologram to have the second polarization state, which is different from the polarization state (first polarization state) of the reconstructed beam from the first hologram. Thus, the recorded hologram can be easily identified at a later stage whether or not it is a re-recorded hologram (second hologram), and effectively reproduced without crosstalk. See page 24, line 22-page 25, line 8.

The polarization state of the recording beam does not necessarily match with the polarization state of the reconstructed beam from the resultant recorded hologram. The recording beam is formed of a signal beam and a reference beam. For example, when the p-polarized light is used as the reference beam and the reading beam, and when the first hologram is recorded by the p-polarized signal beam, the reconstructed beam from the first hologram is p-polarized light. In this case, the signal beam for the second hologram is changed to s-polarized light so that the reconstructed beam from the second hologram is changed to s-polarized light. Therefore, Applicants submit that claim 6 is clear and does not

need to recite additional structure. However, claim 6 is amended for clarity. Withdrawal of the rejection is respectfully requested.

The Office Action objects to claims 1, 4-9, 13, 14 and 21-24 for informalities.

With respect to the objection to claims 21 and 22, claims 21 and 22 are amended to clarify that the re-recording and retaining is performed to re-record and retain the reproduced information obtained from the reconstructed beam (which is diffracted from the first hologram) as a second hologram. As described in the specification starting at the last paragraph of page 17, for example, the reconstructed beam from the first hologram is received by a photo-detector, thereby reproducing (decoding) information (data) recorded as the first hologram, and on the basis of this reproduced information (data), exposure schedule and the like for the subsequent re-recording is calculated.

With respect to the objection regarding the phrase "re-recording...as a hologram," as recited in claims 1, 4, 5, 9, 23 and 24, these claims are amended to obviate the objection.

With respect to the objection regarding the phrase "subsequent re-recording and retaining includes position information representing a position," as recited in claims 4 and 12, claims 1, 4, 5, 9 and 12 are amended to obviate the rejection. In particular, claims 1, 5 and 9 recite that the second hologram is recorded in a same or different position as where the first hologram is recorded. With respect to claims 4 and 12, the position information represents the "position" where the second hologram is recorded.

With respect to the objection regarding the phrase "the hologram" and "the hologram following the re-recording" recited in claim 6, claim 6 is amended to obviate the objection.

At least for these reasons, withdrawal of the objections is respectfully requested.

The Office Action rejects claims 1, 4-7, 9, 12, 14 and 21-24 under 35 U.S.C. §103(a) over U.S. Patent No. 6,377,367 to Suganuma. This rejection is respectfully traversed.

Claim 21 recites that the reproduced information is subsequently re-recorded and retained in the optical recording medium when the intensity of the reconstructed beam has decreased to the predetermined value or less.

Suganuma discloses a method that uses two identical holograms to reproduce the holograms, and simultaneously superposing and recording these holograms using interferences of the reading beams for the holograms and the reconstructed beams from the holograms. As discussed at columns 7-8, Suganuma discloses that two identical holograms are recorded using an object beam and two reference beams, i.e., first and second reference beams. See Fig. 1 of Suganuma. When reproducing these holograms, the first reading beam that is identical with the first reference beam, and the second reading beam that is conjugate to the second reference beam, are irradiated to the holograms. See Fig. 3 of Suganuma. As a result, the first reconstructed beam from the first hologram and the second reconstructed beam from the second hologram, which is conjugate to the first reconstructed beam, are diffracted. Due to the interference of the reconstructed beams, new holograms that are identical with the first and second holograms are recorded and superposed on the original holograms respectively.

Therefore, Suganuma does not teach or suggest determining whether to re-record the original (first) hologram based on the intensity of the reconstructed beam. In particular, Suganuma specifically discloses at col. 7, line 63-col. 8, line 4 that the superposing of the holograms is performed every time the first and second holograms 2 and 3 are reproduced from the hologram recording medium 1, to lengthen the lifetime of each hologram. That is, as discussed at col. 7, lines 31-50, the first hologram 2 and the second hologram 3 are reproduced simultaneously, and at the same time, a new hologram is superposed on the first hologram 2, and the second hologram 3 by the interference between the respectively reproduced beams and reading beams. In other words, Suganuma does not teach or suggest

that the superposing of the hologram is performed based on the intensity of the reconstructed beams. Because the reproduction and re-recording of Suganuma requires at least two identical holograms in principle, the re-recording is always performed at the time of reproduction, there is no need to determine whether re-recording the first hologram is needed, as recited in claim 21. Thus, Suganuma teaches away from claim 21, and thus does not teach or suggest all features of claim 21. As such, claim 21 is patentable over Suganuma.

Claim 22 recites subsequently re-recording and retaining the reproduced information in the optical recording medium when the number of times of reproduction has exceeded the predetermined value. As discussed above, Suganuma does not need to determine whether re-recording of the first hologram is needed, and Suganuma does not teach or suggest that the superposing of the hologram is performed based on the number of reproductions. Therefore, similar to the above discussion with respect to claim 21, Suganuma teaches away from claim 22 and thus does not teach or suggest all features of claim 22. Thus, claim 22 is patentable over Suganuma.

Claims 1, 4-7, 9, 12, 14, 23 and 24 are patentable at least for their dependence on their allowable base claims, as well as for the additional features they recite. For instance, Suganuma uses the reading beams and reproduced beams themselves for the re-recording and does not re-record the reproduced information obtained from the reconstructed beam as the second hologram based on the reproduced information (data). Therefore, Suganuma does not teach or suggest that the positions of re-recording can be arbitrary changed, as recited in claims 1 and 9. Furthermore, Suganuma does not teach or suggest to enable recording of additional information, such as position information in the second hologram, as recited in claims 4 and 12, or adjusting the intensity of the reconstructed beam of the second hologram to have a value that can be detected, as recited in claim 5. These features cannot be achieved

from Suganuma in which new holograms are always superposed on the original holograms by using only the reading beams and the reconstructed beams from the original holograms.

At least for these reasons, withdrawal of the rejection is respectfully requested.

The Office Action rejects claims 8 and 13 under 35 U.S.C. §103(a) over Suganuma in view of U.S. Patent No. 6,452,890 to Kawano et al. (Kawano). This rejection is respectfully traversed.

Kawano does not overcome the deficiencies of Suganuma with respect to claims 21 and 22. Therefore, claims 8 and 13 are patentable at least for their dependence on allowable base claims, as well as for the additional features they recite. Withdrawal of the rejection is respectfully requested.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the application are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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